CDC /NCID
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL CENTER FOR INFECTIOUS DISEASES

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FOCUS

Communicating NCID's prevention and control programs for new and reemerging infectious diseases

Message from the Director

Dear Colleagues:

This month's issue of *Focus* highlights some of NCID's efforts to expand surveillance and laboratory diagnostic capabilities. A welcome development that will strongly increase the ability of NCID programs to perform their research mission will be the new NCID laboratory building (Building 17), which will be built at Clifton Road. Groundbreaking for the construction will take place in late fall of this year; completion is scheduled for the end of 1999.

Phase 1 will provide 100,000 square feet of laboratory/office space for biosafety levels 2 and 3 research activities, accommodating more than 200 researchers. Phase 2 will add another 48,000 square feet.

The building was planned and designed with extensive input from the Division of AIDS, STD, and TB Laboratory Research, the Division of Bacterial and Mycotic Diseases, the Division of Viral and Rickettsial Diseases, the Hospital Infections Program, and the Scientific Resources Program.

The new facility will provide some relief from overcrowded conditions, enhance the level of worker and environmental safety, and enable NCID to further strengthen its role in emerging infectious disease research.

James M. Hughes, M.D.

Focus on Parasitic Diseases

DPD and collaborators lead scientific advances in cysticercosis prevention and control

Technologic advances in the prevention, control, diagnosis, and treatment of cysticercosis, led by Division of Parasitic Diseases researchers and collaborators, are adding new tools to fight an ancient zoonotic disease. The division's long-term efforts in this area are reflected in its being designated (pending approval) a World Health Organization (WHO) Collaborating Center for Cysticercosis.

Each year cysticercosis affects millions of persons in Latin America, Africa, and Asia, often causing severe neurologic disorders or death. The infection is acquired by ingesting eggs through fecal-oral contact with a carrier of the pork tapeworm, *Taenia solium*. The incidence of disease is highest in rural populations where it is associated with traditional pig-rearing practices, inadequate sanitation, and poverty.

A diagnostic test for cysticercosis, the enzyme-linked immunoblot assay, developed by CDC scientists, has revolutionized the study of the epidemiology of cysticercosis. Before this serologic test existed, human cysticercosis was largely diagnosed by computed tomographic scan and magnetic resonance imaging, tools that are too costly and inaccessible for large-scale surveys. Another useful aid for controlling this disease is oxfendazol, a drug that is 100% effective in swine, discovered by CDC and Peruvian collaborators.

PHOTO: Victor Tsang

Children and pigs in the village of Huancyao in Peru, an area of high cysticercosis transmission.

Although cysticercosis is not endemic in North America, imported and introduced infections are rising, usually associated with immigrants who moved from *T. solium*–endemic areas. To respond to this situation, DPD is collaborating with the Emergency Department Surveillance Network for Emerging Infectious Diseases, a sentinel surveillance system in emergency departments of 11 U.S. target hospitals, funded by NCID and coordinated by the Olive View/University of California at Los Angeles Educational and Research Institute. According to Vance Dietz, DPD, to date, 8 of 298 (2.7%) persons admitted with seizures have tested positive for *T. solium* by immunoblot.

DPD has also begun taking steps to inform U.S. neurologists of this emerging disease. In March, DPD presented a continuing medical education-accredited workshop on cysticercosis at the 1997 annual meeting of the American Academy of Neurologists. In 1995, DPD's Victor Tsang and Peter Schantz consulted with international scientists at a WHO/ Pan American Health

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Cysticercosis prevention – continued from page 1

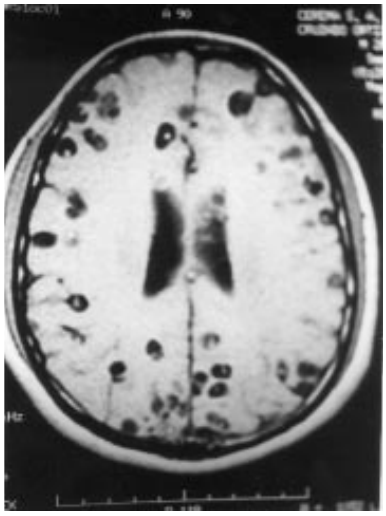

PHOTO: Hugo Garcia

A view of the brain of a cysticercosis patient with multiple lesions, using MRI.

Organization (PAHO) meeting in Brasilia, Brazil.

DPD's future efforts include developing a rapid, simple, field-applicable diagnostic test; continuing to characterize the taeniasis antigen; developing an assay to detect infections by adult worms; expanding the emergency department domestic surveillance system; establishing the immunoblot assay test for diagnosis; and expanding collaborative epidemiologic investigations and pilot control programs in cysticercosis-endemic countries. ■

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Cases of *Cyclospora* infection reported again this spring, summer

As of mid-July, over 1,000 cases of *Cyclospora* infection have been reported to CDC this spring and summer, associated with raspberries imported from Guatemala, as well as other types of fresh produce. According to Barbara Herwaldt, Division of Parasitic Diseases, to date, more than 40 clusters of cases of *Cyclospora* infection have been reported. CDC is continuing to work with the Food and Drug Administration, Health Canada, state and local health departments, the government of Guatemala, and the Guatemalan Berries Commission in the investigations. In the June 13, 1997 *MMWR*, CDC advised that persons with prolonged diarrheal illness be evaluated for the possibility of *Cyclospora* infection. This year is clearly a different picture from last year, Dr. Herwaldt notes, with other types of fresh produce, besides raspberries, linked with cyclosporiasis. ■

Focus on AIDS, STD, and TB Laboratory Research

Surveillance system to assess drug-resistant HIV in the United States and Europe

As the number of HIV-infected persons receiving antiretroviral therapy increases, the emergence and transmission of HIV strains with resistance to these drugs become increasing public health concerns. Rich Respess, Walid Heneine, Tom Folks, and Steve McDougal of the Division of AIDS, STD, and TB Laboratory Research (DASTLR) have recently begun a collaborative project with colleagues in the Division of HIV/AIDS Prevention—Surveillance and Epidemiology, National Center for HIV, STD, and TB Prevention, and the Hospital Infections Program to establish a pilot surveillance system to assess antiretroviral drug resistance among key populations of HIV-infected persons in the United States and to compare laboratory and surveillance findings with those from a similar surveillance system being implemented in Europe. In the United States, populations to be studied include 1) adult seroconverters; 2) infected pregnant women who are beginning antiretroviral therapy to prevent perinatal transmission; 3) perinatally infected infants; and 4) patients who were the source for needlestick injuries sustained by health care workers. In Europe, the surveillance effort will focus on infected patients seeking initial treatment at selected hospital clinics. Sample populations will reflect demographic and geographic diversity as well as differences in HIV transmission modes.

Serum samples from persons in each population will be sent to DASTLR for HIV amplification and genetic sequencing of the *pol* gene, including the targets of currently available antiretroviral drugs (reverse transcriptase and protease), to look for mutations associated with drug resistance. Phenotypic changes will be monitored by culture and several novel methods. In addition, DASTLR staff will be collaborating with researchers involved in the European effort to evaluate new technologies to more rapidly and inexpensively assess both genotypic and phenotypic markers of resistance.

Information obtained from these surveillance systems will be used to 1) assess whether resistant virus is being transmitted from infected persons under treatment; 2) describe the distribution of resistant viral genotypes among populations and their relationship to antiretroviral chemotherapy; 3) develop optimal treatment strategies for untreated patients and target these for geographic areas; and 4) determine the need for new interventions to prevent the spread of resistant strains. ■

Focus on Hospital Infections

HIP investigates infant deaths in Brazil

Staff from the Hospital Infections Program investigated, in November 1996, an outbreak of fever and death in 33 infants in a hospital in Brazil.

Denise Garrett (EIS) and Clifford McDonald (EIS), HIP, found an association between the deaths and intrinsic contamination of intravenous (IV) fluids given to the infants. Inadequate infection control practices also played a part in the outbreak.

Drs. Garrett and McDonald conducted three cohort studies and a case-control study during their investigation. All episodes of fever among the neonates occurred only after these patients had received IV fluids.

Although cultures of IV medications were negative, unopened vials of distilled water (used to dilute the IV medications) were found to have high levels of endotoxin. This contaminated product likely caused fever in the infants, which may have made them vulnerable to bloodstream infections that caused their deaths.

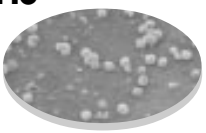
"We also found that many of the infants really didn't require IV medications," Dr. Garrett said. "We recommended that the placement of IV devices and medication be reserved for those infants for whom it is clearly warranted."

Denise Garrett (L) and Clifford McDonald, HIP, investigated the outbreak of fever among infants in Brazil.

The contaminated fluid in this outbreak was distributed nationally, and similar outbreaks and deaths among neonates have been reported throughout Brazil. Manufacture of the product has been discontinued, and efforts are ongoing to track its distribution.

"Any time a cluster of fevers occurs among hospitalized patients, the clinician should consider the possibility of a contaminated product," Dr. Garrett said. ■

HIP-HICPAC produce recommendations for vancomycin-resistant *S. aureus*



The first clinical isolate of *Staphylococcus aureus* with low-level resistance to vancomycin was recently reported in Japan. Because vancomycin is considered the last line of defense against staphylococcal infections in many countries, including the United States, the emergence of resistant strains is a serious public health concern.

The strain, identified in a patient with a surgical site infection, required a minimum inhibitory concentration to vancomycin of 8 µg/ml and was resistant to methicillin and many other antimicrobial agents. The patient was treated with arbekacin (an aminoglycoside not available in the U.S.) and ampicillin/sulbactam. The patient responded to therapy and was discharged.

The Hospital Infections Program and the Hospital Infection Control Practices Advisory Committee have recently published recommendations for the prevention and control of vancomycin-resistant *S. aureus* that reinforce the importance of 1) appropriate use of antimicrobial agents, particularly vancomycin; 2) the ability of microbiology laboratories to identify vancomycin-resistant staphylococcal species; and 3) infection control precautions for antimicrobial-resistant pathogens (*MMWR* 1997;46:626). ■

Partners in Prevention

In July 1996, Ann Marie Kimball and colleagues at the University of Washington (UW) School of Public Health and Community Medicine launched an international effort to promote the regular exchange of information on emerging infectious diseases among Asia-Pacific countries through the use of modern information technologies. The Asia-Pacific Economic Cooperation (APEC) Emerging Infections Network (EINet) is supported at UW through a cooperative agreement with NCID/CDC, with in-kind informatics support from Patrick O'Carroll of CDC's INPHO project, Public Health Practice Program Office.

The APEC EINet project seeks to

◆ Promote enhanced, secure communication of surveillance data and other information on emerging and reemerging infections among scientists and policy makers in the Asia-Pacific region through the use of modern information technologies;

◆ Increase and strengthen collaborations among political, academic, and business communities concerned with emerging infectious diseases in APEC countries;

◆ Enhance the depth, range, and nature of health and medical information accessible through the evolving, UW-based APEC Educational Telecommunications Network (APEC EduNet).

The EINet project was launched by scientists from five APEC countries (Indonesia, the Philippines, Thailand, Canada, and the United States), who have identified drug-resistant tuberculosis as a first priority for improved international data and information exchange. Project partners are currently identifying in-country tuberculosis data that would be useful to share among EINet partners and are developing appropriate formats and secure mechanisms for sharing this data via the World-Wide Web. For more information, see http://www.apec.org/infectious. ■

Focus on Bacterial and Mycotic Diseases

Diarrhea surveillance established in Kenya

The Division of Bacterial and Mycotic Diseases (DBMD) is collaborating with the Division of Parasitic Diseases to add diarrheal surveillance to the activities already being conducted at the CDC/Kenya Medical Research Institute (KEMRI) field station in Kisumu, Western Kenya. In April, Larry Slutsker, Joy Wells, Marta Ackers (EIS), and Roger Shapiro (EIS) traveled to Kenya to establish surveillance activities, working with Bernard Nahlen, director, CDC/KEMRI, and other health officials.

Diarrhea is a major cause of illness and death in sub-Saharan Africa. However, surveillance data on the causes, relative importance, and antimicrobial susceptibility patterns of specific diarrheal pathogens are lacking. Such data can establish the magnitude of the problem and trends in incidence, provide guidance on effective therapy, and help direct studies to identify prevention strategies. The project in Kenya has the following objectives:

1. Provide the CDC/KEMRI field station with the capacity to isolate, identify, and determine antimicrobial resistance of *Shigella* species, *Escherichia coli* O157, *Vibrio cholerae* O1 and O139, *Salmonella,* and *Campylobacter.*

2. Collect information on the incidence, illnesses, and deaths from diarrhea in the study populations and estimate the proportion of each attributable to specific pathogens.

3. Determine risk factors for transmission of important diarrheal pathogens and identify potential prevention strategies.

CDC/KEMRI staff will incorporate diarrheal surveillance into ongoing projects, including a population-based study of the impact of permethrin-treated bed nets on childhood mortality and a hospital-based prospective study to determine the interaction between placental malaria infection, vertical transmission of HIV infection, and progression of HIV-related disease among infants. These studies will also include an assessment of the magnitude and impact of diarrheal diseases among the study populations.

Joy Wells (center), DBMD, describes methods for isolating and identifying enteric pathogens to Bernard Nahlen and Lata Kumar, CDC/KEMRI Field Station.

DBMD laboratorians have begun training local laboratory personnel in isolating and identifying enteric pathogens, and have identified additional equipment and supplies that will be obtained to enhance the capability of the field station laboratory. Once systems for specimen and data collection from clinics and hospitals have have been established, the focus of the project will shift to epidemiologic studies of diarrhea in this region. Dr. Slutsker states, "We believe this collaboration between DBMD and the CDC/KEMRI field station will provide valuable information to enhance our efforts to prevent illnesses and deaths from these important causes of diarrheal disease." ■

IDEA Place

"I hope I never have to use what we learned!" That sentiment was often expressed at the recent field test of *VHF Precautions: Managing Infection Control of Viral Hemorrhagic Fevers in an African Health Care Setting*. The manual, developed by the Special Pathogens Branch, Division of Viral and Rickettsial Diseases, is designed to address fears and provide clear guidelines for health workers who manage outbreaks of such diseases as Ebola or Lassa fever.

In the 1995 Zaire Ebola outbreak, 25% of those infected were health care workers. That outbreak demonstrated that using isolation precautions can halt the spread of hospital-based Ebola hemorrhagic fever. *VHF Precautions,* a ready reference for hospitals, recommends using locally available, inexpensive supplies and outlines steps to prepare a facility for VHF isolation precautions.

To find out whether the manual's recommendations were meaningful to potential users, in May 1997, a 4-day workshop was conducted in Western Kenya, sponsored by the Kenyan Ministry of Health, the WHO VHF Collaborating Center at Kenya Medical Research Institute (KEMRI), WHO, and CDC. Both traditional and interactive methods were used to review the material. Participants built an incinerator, made gowns, caps, and masks with a local tailor, and prepared disinfectant from household bleach. A mock isolation room was set up, and participants wore their protective clothing.

The results of the evaluation will be used to revise the manual and the training.

Ethleen Lloyd
Division of Viral and Rickettsial Diseases

NEWS BRIEFS

DVRD measles group receives Shepard Award

Scientists from the Measles Section, Respiratory and Enteric Viruses Branch, DVRD, and their non-CDC colleagues were one of two groups of authors to receive the Shepard Science Award on May 2 for the best scientific paper published by CDC authors during 1996. Jennifer Rota, Janet Heath, Paul Rota, Gail King, Maria Celma, Juan Carabaña, Rafael Fernandez-Muñoz, David Brown, Li Jin, and William Bellini were honored for their paper, "Molecular Epidemiology of Measles Virus: Identification of Pathways of Transmission and Implications for Measles Elimination," published in the *Journal of Infectious Diseases* (1996;173:32-7).

(L-R) Dixie Snider, CDC associate director for science, presented plaques to Jennifer Rota, Janet Heath, William Bellini, and Paul Rota of DVRD's Measles Section during the Shepard Award ceremony on May 2.

According to DVRD Director Brian Mahy, the authors "confirmed the elimination of endemic measles in the United States in 1993 and showed that imported virus was the source for most measles outbreaks in this country after 1993. This type of molecular surveillance of measles strains will be crucial for future efforts to eradicate measles globally."

Diana Schendel and colleagues from NCEH and NCCDPHP were co-winners of the award for their paper, "Prenatal Magnesium Sulfate Exposure and the Risk for Cerebral Palsy or Mental Retardation among Very Low-Birth-Weight Children Aged 3 to 5 Years" (*JAMA*, 1996;276:1805-10).

New CFS panel convenes

The Chronic Fatigue Syndrome Coordinating Committee, a new federal advisory panel, held its first meeting on May 29, 1997, in Washington, D.C. Cochaired by DVRD Director Brian Mahy, the committee consists of representatives from U.S. health agencies and major CFS patient advocacy groups. According to Dr. Mahy, the committee will meet regularly to review CFS research priorities and other activities of participating agencies. DVRD, through its Viral Exanthems and Herpesvirus Branch, conducts research on the epidemiology, etiology, and natural history of CFS. At its initial meeting, the panel discussed issues regarding the name "chronic fatigue syndrome" and established a subcommittee to explore concerns of CFS patients who are seeking to change the name of this debilitating illness. The next meeting of the committee will be held in Washington, D.C., on October 22, 1997.

Newsletter on antibiotic resistance published

The CAUSE (Careful Antibiotic USE), the newsletter of the Judicious Antibiotic Use Campaign, is available for people who are interested in halting the spread and decreasing the incidence of antibiotic resistance. It will be distributed on a quarterly basis and will highlight the progress and activities of CDC and its partners in changing the practices of parents and providers as they relate to antibiotic use. Issues will also include educational resources and information on relevant meetings and conferences and funding opportunities. To subscribe, contact Lela Folkers, CDC, 1600 Clifton Road, MS C14, Atlanta, GA 30333.

External panel evaluates REVB activities

Six scientists from nonfederal medical or health institutions conducted a peer review of the Respiratory and Enteric Viruses Branch, DVRD, at CDC on May 21-23. The review, which examined the branch's work for the past 6 years, was part of DVRD's ongoing effort of having the division's programs regularly peer reviewed by non-CDC experts.

Participating in the 3-day program assessment were (seated, L-R) Dale Morse, director of epidemiology, New York State Department of Health; Peter Wright, Vanderbilt Medical Center; Neal Nathanson, University of Pennsylvania Medical Center; Gail Wertz, University of Alabama School of Medicine; and L. Andrew Ball, University of Alabama School of Medicine; (standing, L-R) Richard Compans, Emory University School of Medicine; Brian Mahy, director, DVRD; Rima Khabbaz, deputy director, DVRD; Larry Anderson, chief, REVB; Olen Kew, chief, Molecular Virology Section, REVB; Dean Erdman, acting chief, Respiratory Virus Section, REVB; Mark Pallansch, chief, Enterovirus Section, REVB; Roger Glass, chief, Viral Gastroenteritis Section, REVB; and Ralph Tripp, microbiologist, Respiratory Virus Section, REVB.

Focus on Viral and Rickettsial Diseases

Scientists seek to improve Pan American surveillance for influenza, respiratory viruses

Scientists from Latin American and Caribbean nations participated in a laboratory training course, "Diagnosis of Influenza and Other Respiratory Viruses," at the Instituto de Salud Publica de Chile in Santiago, Chile, on April 21-25. The course was cosponsored by the Pan American Health Organization (PAHO), the World Health Organization (WHO), and the Influenza Branch, Division of Viral and Rickettsial Diseases. Financial support for the course was provided through NCID's emerging infectious diseases initiative.

"Laboratory training and technology transfer are pivotal to the development and success of an active global infectious disease surveillance program," according to Nancy Cox, chief of the Influenza Branch, one of three WHO Collaborating Centers of Influenza.

The objectives of the course were to strengthen laboratory diagnostic capabilities, improve surveillance, and increase networking in Latin American and Caribbean countries. The training covered various laboratory methodologies, including virus isolation, identification, direct detection, and serologic diagnosis of respiratory virus infections. Genetic analysis of influenza viruses and an assay to detect antiviral resistance of influenza A viruses were also taught. Evening sessions emphasized surveillance and epidemiology of respiratory viruses and encouraged networking among the participants.

Participating scientists recommended that similar conferences be held every 2 years (the previous PAHO/WHO/CDC training conference was held in 1992 and was attended by representatives from only five countries). In addition, several countries, including Costa Rica, Jamaica, Mexico, and Panama, plan to either initiate new disease surveillance activities or revitalize existing systems in their countries, according to Dr. Cox. ■

Instructors and lecturers for the course included (first row, L-R) Rodrigo Fasce (1st), Graciela Torres (2nd), Dean Erdman (3rd), Helen Regnery (5th), Henrietta Hall (6th), Manuela Vicente (7th); (second row) Daniel Lavanchy (1st), Nancy Cox (5th), Catherine Bender (6th); (fourth row) Hector Izurieta (6th), and Jose Ramiro Cruz (9th). The course was attended by 23 scientists from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, French Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, Trinidad, Uruguay, and Venezuela.

1997 Honor Awards presented to NCID staff

News Makers

Awards

Stuart Nichol, chief, Molecular Biology Section, Special Pathogens Branch, DVRD, received the American Society of Virology Ho Wang Lee Lecturer Award in recognition of his accomplishments in the genetic analysis of hantaviruses and filoviruses and his contributions to CDC's response to public health emergencies associated with these viruses.

Staff Changes

Steven Bice, public health advisor, recently joined the Hepatitis Branch, DVRD, as assistant branch chief, with responsibility for selected program and administrative/budget activities. He was formerly with the Health Resources and Services Administration in their field office in San Francisco.

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News Makers – continued from page 7

Carolyn Erling has joined DPD as secretary to Director Dan Colley and Associate Director for Medical Science Sue Binder. Ms. Erling was formerly secretary to Martin Favero in the Hospital Infections Program.

Rima Khabbaz has been named deputy director, DVRD. Dr. Khabbaz had previously served as the division's associate director for medical science.

Christi Murray recently joined DPD as program manager for the Kenya Medical Research Institute (KEMRI)/CDC field station. She comes to DPD from the Division of Oral Health, NCCDPHP, where she was acting deputy director from September 1996 through March 1997.

Kanta Subbarao has joined the Influenza Branch, DVRD, as acting chief of the Molecular Genetics Section. Dr. Subbarao will oversee the branch's studies on the evolution and structure of influenza viruses and genetically engineered influenza viruses and vaccines. She was formerly with the Departments of Pediatrics and Microbiology, McGill University, Montreal.

Retirement

Lucille Kearney, secretary, Epidemiology Branch, DPD, retired June 30 after 12 years at CDC.

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